Additional Information about the White Paper, *Valuing Mortality Risk for Policy: a Meta-analytic Approach*, provided by EPA (May 10, 2016) at the request of the Science Advisory Board Environmental Economics Advisory Committee.

Requests to EPA from members of the SAB Environmental Economics Advisory Committee for additional Information about the White Paper, *Valuing Mortality Risk for Policy: a Meta-analytic Approach* and EPA Responses.

May 10, 2016

1. *Can you provide a robustness check excluding one observation at a time in addition to what has already been done excluding one study at a time?*

   Response: Table R1 below augments Table 6 in EPA's 2016 White Paper. This table includes additional columns indicating the observation, study, and sample IDs which aids in cross-referencing the influence analysis results tables below), plus dichotomous variables indicating which mean VSL observations were calculated from reported median VSL estimates and which medians were converted to means (relevant for determining which median and mean observations might be included in the same regression model). Tables R2-R4 show results of influence analyses based on excluding studies, independent samples, and observations, respectively.

   Table R1: VSL Studies and Observations with IDs

	observation ID	study group ID	sample group ID	year of publication	year of data collection	mean indicator	mean calculated from median	median converted to mean	SP indicator	sample size	VSL [$2013]	SE [$2013]
Hammitt & Graham 1999	1	1	1	1999	1996	0	0	1	1	992	2.97	0.328
	2	1	2	1999	1996	0	0	1	1	992	1.79	0.199
	3	1	1	1999	1996	1	1	0	1	992	6.71	0.327
	4	1	2	1999	1996	1	1	0	1	992	4.03	0.201
	5	1	3	1999	1996	0	0	0	1	973	38.59	11.714
	6	1	3	1999	1996	0	0	0	1	973	14.29	4.662
	7	1	4	1999	1996	0	0	0	1	973	65.74	15.557
	8	1	4	1999	1996	0	0	0	1	973	17.15	0.798
Corso, Hammitt, & Graham 2001	9	2	5	2001	1998	0	0	1	1	288	5.01	0.672
	10	2	5	2001	1998	0	0	1	1	288	7.71	1.397

	11	2	5	2001	1998	1	1	0	1	288	13.68	2.839
	12	2	5	2001	1998	1	1	0	1	288	21.07	5.142
	13	2	6	2001	1998	0	0	1	1	263	4.33	0.635
	14	2	6	2001	1998	1	1	0	1	263	10.53	2.034
	15	2	7	2001	1998	0	0	1	1	263	5.68	0.897
	16	2	7	2001	1998	1	1	0	1	263	13.82	2.840
	17	2	8	2001	1998	0	0	1	1	275	4.06	0.556
	18	2	8	2001	1998	1	1	0	1	275	11.63	2.571
	19	2	9	2001	1998	0	0	1	1	275	4.47	0.718
	20	2	9	2001	1998	1	1	0	1	275	12.78	2.974
Alberini, Cropper, Krupnick, & Simon 2004	21	3	10	2004	2000	0	0	1	1	556	0.98	0.080
	22	3	10	2004	2000	1	1	0	1	556	2.15	0.243
	23	3	11	2004	2000	0	0	1	1	548	1.54	0.196
	24	3	11	2004	2000	1	1	0	1	548	6.75	1.035
Hammitt & Hanninger 2010	25	4	12	2010	2007	0	0	0	1	2018	7.30	1.337
	26	4	12	2010	2007	0	0	0	1	2018	7.42	1.337
Cameron, DeShazo, & Johnson 2010	27	5	13	2010	2002	0	0	0	1	1801	8.58	1.965
Cameron, DeShazo, & Stiffler 2013	28	6	13	2010	2002	0	0	0	1	1801	7.64	1.974
Chestnut, Rowe, & Breffle 2012	29	7	14	2012	2002	1	0	0	1	845	10.48	0.826
	30	7	14	2012	2002	1	0	0	1	845	6.53	0.429
	31	7	14	2012	2002	1	0	0	1	845	3.63	0.231
	32	7	14	2012	2002	1	0	0	1	845	9.28	0.925
	33	7	14	2012	2002	1	0	0	1	845	5.93	0.529
	34	7	14	2012	2002	1	0	0	1	845	3.39	0.330
	35	7	14	2012	2002	1	0	0	1	845	4.89	0.396
	36	7	14	2012	2002	1	0	0	1	845	2.86	0.198
	37	7	14	2012	2002	1	0	0	1	845	1.84	0.198
	38	7	14	2012	2002	1	0	0	1	845	5.84	0.562
	39	7	14	2012	2002	1	0	0	1	845	3.42	0.363
	40	7	14	2012	2002	1	0	0	1	845	2.20	0.396

Cameron & DeShazo 2013	41	8	15	2013	2002	1	0	0	1	1801	7.49	3.207
	42	8	15	2013	2002	1	0	0	1	1801	7.12	3.193
	43	8	15	2013	2002	1	0	0	1	1801	6.86	3.233
	44	8	15	2013	2002	1	0	0	1	1801	7.14	3.322
Viscusi, Huber, & Bell 2014	45	9	16	2014	2009	1	0	0	1	3430	11.24	0.083
	46	9	16	2014	2009	1	0	0	1	3430	15.96	0.118
Viscusi 2003	47	10	17	2003	1997	1	0	0	0	93360	17.96	8.490
	48	10	17	2003	1997	1	0	0	0	93360	16.58	7.857
Viscusi 2004	49	11	17	2004	1997	1	0	0	0	99033	6.10	3.251
	50	11	17	2004	1997	1	0	0	0	99033	3.63	2.862
	51	11	17	2004	1997	1	0	0	0	99033	6.82	4.013
	52	11	17	2004	1997	1	0	0	0	99033	3.77	3.454
Kneiser & Viscusi 2005	53	12	17	2005	1997	1	0	0	0	99033	5.02	0.837
	54	12	17	2005	1997	1	0	0	0	99033	5.18	0.797
Viscusi & Aldy 2007	55	13	17	2007	1998	1	0	0	0	120008	8.61	1.201
Aldy & Viscusi 2008	56	14	17	2008	1997	1	0	0	0	123439	8.68	1.210
	57	14	18	2008	1993	1	0	0	0	123439	7.10	1.151
	58	14	19	2008	1994	1	0	0	0	123439	7.40	1.189
	59	14	20	2008	1995	1	0	0	0	123439	7.11	1.194
	60	14	21	2008	1996	1	0	0	0	123439	7.47	1.201
	61	14	22	2008	1998	1	0	0	0	123439	8.61	1.191
	62	14	23	2008	1999	1	0	0	0	123439	9.30	1.074
	63	14	24	2008	2000	1	0	0	0	123439	9.99	1.273
Viscusi & Hersch 2008	64	15	25	2008	1999	1	0	0	0	138175	9.98	3.816
Hersch & Viscusi 2010	65	16	26	2010	2003	1	0	0	0	50673	10.07	8.270
Scotten & Taylor 2011	66	17	27	2011	1997	1	0	0	0	43261	12.63	4.180
	67	17	27	2011	1997	1	0	0	0	43261	14.37	3.745
	68	17	27	2011	1997	1	0	0	0	43261	8.42	2.584
Scotten 2013	69	18	28	2013	2006	1	0	0	0	121608	18.43	4.447
	70	18	28	2013	2006	1	0	0	0	121608	20.99	4.276

	71	18	28	2013	2006	1	0	0	0	121608	15.56	5.173
	72	18	28	2013	2006	1	0	0	0	121608	13.13	3.506
	73	18	28	2013	2006	1	0	0	0	121608	14.88	3.677
	74	18	28	2013	2006	1	0	0	0	121608	12.91	3.378
	75	18	28	2013	2006	1	0	0	0	121608	14.41	4.844
	76	18	28	2013	2006	1	0	0	0	121608	17.06	4.523
	77	18	28	2013	2006	1	0	0	0	121608	12.21	5.496
	78	18	28	2013	2006	1	0	0	0	121608	9.41	3.896
	79	18	28	2013	2006	1	0	0	0	121608	11.14	4.102
	80	18	28	2013	2006	1	0	0	0	121608	9.35	3.790
	81	18	28	2013	2006	1	0	0	0	84336	16.99	4.886
	82	18	28	2013	2006	1	0	0	0	84336	17.60	3.416
	83	18	28	2013	2006	1	0	0	0	84336	19.16	4.800
	84	18	28	2013	2006	1	0	0	0	84336	19.72	3.373
	85	18	28	2013	2006	1	0	0	0	84336	14.53	4.583
	86	18	28	2013	2006	1	0	0	0	84336	16.04	2.811
	87	18	28	2013	2006	1	0	0	0	84336	6.36	3.416
	88	18	28	2013	2006	1	0	0	0	84336	6.96	3.416
	89	18	28	2013	2006	1	0	0	0	84336	9.04	2.724
	90	18	28	2013	2006	1	0	0	0	84336	7.61	2.897
	91	18	28	2013	2006	1	0	0	0	84336	8.73	2.897
	92	18	28	2013	2006	1	0	0	0	84336	9.38	2.119

Per SAB request, we conduct additional influence analyses and include the results in the following three tables, R2-R3. R2 shows the study level influence analysis to augment Table 10 in EPA's 2016 White Paper. Table R2 includes corrected results for the mean of group means influence analyses.[1] Table R3 reports influence analysis results from excluding independent samples rather than studies, and Table R4 reports results from excluding observations. Study, sample, and observation IDs correspond to studies listed in Table R1 above. Cross-referencing the IDs in these tables will indicate the number of observations that are dropped when studies or samples are excluded.

Table R2: Influence analysis – Study level. Cell entries are the percentage change in each estimator if the study ID listed in the first column is excluded from the dataset.

Excluded study ID	Mean of group means				Maximum likelihood			
	HW	SP	pooled	balanced	HW	SP	pooled	balanced
1	0.00	7.75	3.52	3.87	0.92	6.67	2.74	2.17
2	0.00	-31.67	-11.66	-15.83	1.89	-22.76	-5.17	-7.54
3	0.00	10.71	4.87	5.36	0.22	8.38	4.04	3.18
4	0.00	0.00	0.00	0.00	-0.49	-0.50	-0.52	-0.46
5	0.00	0.00	0.00	0.00	-0.03	-0.73	-0.42	-0.43
6	0.00	0.00	0.00	0.00	-0.03	-0.29	-0.20	-0.23
7	0.00	4.35	2.08	2.18	-0.43	4.87	3.59	3.07
8	0.00	2.35	1.12	1.17	-0.13	2.89	1.65	1.20
9	0.00	-3.33	-1.59	-1.66	-0.66	-7.01	-3.52	-4.43
10	-2.10	0.00	-1.05	-1.05	0.41	0.30	0.15	0.20
11	1.94	0.00	0.97	0.97	1.68	0.61	0.86	0.96
12	0.72	0.00	0.36	0.36	3.02	0.30	0.84	0.96
13	-0.02	0.00	-0.01	-0.01	0.18	0.11	-0.15	-0.09
14	12.55	0.00	3.69	6.28	-2.07	1.44	0.22	2.24
15	-0.57	0.00	-0.27	-0.28	-0.04	0.08	-0.12	0.01
16	-0.28	0.00	-0.13	-0.14	-0.04	-0.06	-0.04	0.01
17	-2.88	0.00	-1.38	-1.44	-0.92	0.45	-0.88	-0.72
18	-2.79	0.00	-1.34	-1.40	-7.61	-5.38	-6.20	-5.83

[1] The results in the tables below for the mean of group means include only mean primary VSL observations. Table 10 in the White Paper erroneously included results for estimations including both mean and median primary VSL observations for the non-parametric models.

Table R3: Influence analysis – Independent sample level. Cell entries are the percentage change in each estimator if the sample ID listed in the first column is excluded from the dataset.

Excluded sample ID	Mean of group means				Maximum likelihood			
	HW	SP	pooled	balanced	HW	SP	pooled	balanced
1	0.00	2.13	1.02	1.07	0.45	1.35	0.84	0.54
2	0.00	4.91	2.35	2.46	0.45	4.28	1.78	1.45
3	0.00	-8.15	-3.89	-4.07	0.57	-6.31	-1.98	-2.28
4	0.00	-1.36	-0.65	-0.68	0.28	-1.59	-0.41	-0.58
5	0.00	-4.62	-2.21	-2.31	0.28	-3.47	-1.10	-1.20
6	0.00	-2.45	-1.17	-1.22	0.28	-1.94	-0.57	-0.66
7	0.00	-3.59	-1.72	-1.79	0.28	-2.33	-0.71	-0.76
8	0.00	7.05	3.37	3.53	0.11	6.25	3.09	2.51
9	0.00	2.69	1.29	1.34	0.11	1.64	0.97	0.56
10	0.00	0.00	0.00	0.00	-0.49	-0.50	-0.52	-0.46
11	0.00	0.00	0.00	0.00	-0.06	-1.60	-0.91	-0.85
12	0.00	4.35	2.08	2.18	-0.43	4.87	3.59	3.07
13	0.00	2.35	1.12	1.17	-0.13	2.89	1.65	1.20
14	0.00	-3.33	-1.59	-1.66	-0.66	-7.01	-3.52	-4.43
15	0.76	0.00	0.36	0.38	4.95	1.61	2.39	3.30
16	1.37	0.00	0.65	0.69	-0.42	0.29	0.19	0.32
17	1.20	0.00	0.57	0.60	-0.41	0.25	0.14	0.30
18	1.58	0.00	0.76	0.79	0.20	0.22	0.28	0.49
19	1.34	0.00	0.64	0.67	0.23	0.18	0.25	0.48
20	0.55	0.00	0.26	0.28	0.06	0.11	0.04	0.34
21	0.09	0.00	0.04	0.05	-0.11	0.08	-0.11	0.23
22	-0.38	0.00	-0.18	-0.19	-0.24	0.04	-0.28	0.08
23	-0.57	0.00	-0.27	-0.28	-0.04	0.08	-0.12	0.01
24	-0.28	0.00	-0.13	-0.14	-0.04	-0.06	-0.04	0.01
25	-2.88	0.00	-1.38	-1.44	-0.92	0.45	-0.88	-0.72
26	-2.79	0.00	-1.34	-1.40	-7.61	-5.38	-6.20	-5.83
27	0.00	2.13	1.02	1.07	0.45	1.35	0.84	0.54
28	0.00	4.91	2.35	2.46	0.45	4.28	1.78	1.45

Table R4: Influence analysis – observation level. Cell entries are the percentage change in each estimator if the observation ID listed in the first column is excluded from the dataset.

Excluded obs. ID	Mean of group means				Maximum likelihood			
	HW	SP	pooled	balanced	HW	SP	pooled	balanced
1	0.00	0.00	0.00	0.00	0.22	0.41	0.26	0.25
2	0.00	0.00	0.00	0.00	0.22	0.73	0.35	0.29
3	0.00	2.13	1.02	1.07	0.22	0.64	0.51	0.14
4	0.00	4.91	2.35	2.46	0.22	3.29	1.54	1.20
9	0.00	0.00	0.00	0.00	0.14	0.62	0.25	0.33
10	0.00	0.00	0.00	0.00	0.14	-0.02	0.07	0.02
11	0.00	3.36	1.68	1.68	0.14	-2.27	-0.84	-1.06
12	0.00	-3.36	-1.68	-1.68	0.14	-2.64	-1.00	-1.05
13	0.00	0.00	0.00	0.00	0.14	0.33	0.18	0.21
14	0.00	-1.36	-0.65	-0.68	0.14	-1.93	-0.62	-0.84
15	0.00	0.00	0.00	0.00	0.14	0.34	0.18	0.17
16	0.00	-4.62	-2.21	-2.31	0.14	-3.21	-1.14	-1.32
17	0.00	0.00	0.00	0.00	0.14	0.46	0.20	0.23
18	0.00	-2.45	-1.17	-1.22	0.14	-2.36	-0.81	-0.93
19	0.00	0.00	0.00	0.00	0.14	0.51	0.22	0.25
20	0.00	-3.59	-1.72	-1.79	0.14	-2.58	-0.90	-1.00
21	0.00	0.00	0.00	0.00	0.05	0.61	0.09	-0.11
22	0.00	7.05	3.37	3.53	0.05	5.22	2.68	2.22
23	0.00	0.00	0.00	0.00	0.05	-0.60	-0.25	-0.31
24	0.00	2.69	1.29	1.34	0.05	0.48	0.47	0.18
25	0.00	0.00	0.00	0.00	-0.24	-0.13	-0.18	-0.19
26	0.00	0.00	0.00	0.00	-0.24	-0.19	-0.22	-0.23
27	0.00	0.00	0.00	0.00	-0.03	-0.73	-0.42	-0.43
28	0.00	0.00	0.00	0.00	-0.03	-0.29	-0.20	-0.23
29	0.00	-0.43	-0.21	-0.21	-0.03	-0.84	-0.51	-0.26
30	0.00	-0.12	-0.06	-0.06	-0.03	-0.11	-0.08	-0.08
31	0.00	0.11	0.05	0.05	-0.03	0.13	0.09	0.04
32	0.00	-0.33	-0.17	-0.17	-0.03	-0.47	-0.31	-0.17
33	0.00	-0.07	-0.04	-0.04	-0.03	-0.04	-0.04	-0.05
34	0.00	0.13	0.06	0.06	-0.03	0.14	0.09	0.05
35	0.00	0.01	0.01	0.01	-0.03	0.04	0.03	-0.01

Excluded obs. ID	Mean of group means				Maximum likelihood			
	HW	SP	pooled	balanced	HW	SP	pooled	balanced
36	0.00	0.17	0.09	0.09	-0.03	0.16	0.11	0.08
37	0.00	0.25	0.13	0.13	-0.03	0.17	0.12	0.12
38	0.00	-0.06	-0.03	-0.03	-0.03	-0.04	-0.03	-0.05
39	0.00	0.13	0.06	0.06	-0.03	0.14	0.09	0.05
40	0.00	0.22	0.11	0.11	-0.03	0.17	0.12	0.10
41	0.00	-0.10	-0.05	-0.05	-0.03	0.17	0.13	0.08
42	0.00	0.01	0.00	0.00	-0.03	0.28	0.20	0.14
43	0.00	0.08	0.04	0.04	-0.03	0.35	0.24	0.18
44	0.00	0.00	0.00	0.00	-0.03	0.26	0.18	0.13
45	0.00	1.98	0.99	0.99	-0.33	2.77	1.71	1.64
46	0.00	-1.98	-0.99	-0.99	-0.33	-4.77	-3.18	-3.46
47	-1.01	0.00	-0.50	-0.50	0.21	0.15	0.07	0.10
48	-0.86	0.00	-0.43	-0.43	0.21	0.15	0.07	0.10
49	0.22	0.00	0.11	0.11	0.15	0.15	0.17	0.18
50	0.47	0.00	0.24	0.24	0.30	0.15	0.27	0.29
51	0.14	0.00	0.07	0.07	0.18	0.15	0.14	0.16
52	0.46	0.00	0.23	0.23	0.16	0.15	0.23	0.25
53	0.33	0.00	0.17	0.17	0.88	0.15	0.37	0.41
54	0.31	0.00	0.16	0.16	0.89	0.15	0.35	0.39
55	-0.02	0.00	-0.01	-0.01	0.18	0.11	-0.15	-0.09
56	-0.05	0.00	-0.02	-0.02	0.28	0.15	-0.05	0.00
57	1.37	0.00	0.65	0.69	-0.42	0.29	0.19	0.32
58	1.20	0.00	0.57	0.60	-0.41	0.25	0.14	0.30
59	1.58	0.00	0.76	0.79	0.20	0.22	0.28	0.49
60	1.34	0.00	0.64	0.67	0.23	0.18	0.25	0.48
61	0.55	0.00	0.26	0.28	0.06	0.11	0.04	0.34
62	0.09	0.00	0.04	0.05	-0.11	0.08	-0.11	0.23
63	-0.38	0.00	-0.18	-0.19	-0.24	0.04	-0.28	0.08
64	-0.57	0.00	-0.27	-0.28	-0.04	0.08	-0.12	0.01
65	-0.28	0.00	-0.13	-0.14	-0.04	-0.06	-0.04	0.01
66	-0.38	0.00	-0.19	-0.19	-0.48	0.15	-0.25	-0.23
67	-1.19	0.00	-0.60	-0.60	-0.88	0.15	-0.57	-0.56
68	1.57	0.00	0.79	0.79	0.04	0.15	0.40	0.52

Excluded obs. ID	Mean of group means				Maximum likelihood			
	HW	SP	pooled	balanced	HW	SP	pooled	balanced
69	-0.18	0.00	-0.09	-0.09	-0.95	-0.16	-0.40	-0.43
70	-0.27	0.00	-0.13	-0.13	-1.34	-0.16	-0.54	-0.57
71	-0.08	0.00	-0.04	-0.04	-0.49	-0.16	-0.25	-0.27
72	0.01	0.00	0.00	0.00	-0.32	-0.16	-0.18	-0.21
73	-0.05	0.00	-0.03	-0.03	-0.63	-0.16	-0.28	-0.31
74	0.02	0.00	0.01	0.01	-0.28	-0.16	-0.17	-0.19
75	-0.04	0.00	-0.02	-0.02	-0.41	-0.16	-0.22	-0.24
76	-0.13	0.00	-0.06	-0.06	-0.76	-0.16	-0.34	-0.36
77	0.04	0.00	0.02	0.02	-0.17	-0.16	-0.14	-0.16
78	0.14	0.00	0.07	0.07	0.33	-0.16	0.02	0.01
79	0.08	0.00	0.04	0.04	0.02	-0.16	-0.08	-0.10
80	0.14	0.00	0.07	0.07	0.37	-0.16	0.03	0.02
81	-0.13	0.00	-0.06	-0.06	-0.68	-0.16	-0.31	-0.34
82	-0.15	0.00	-0.07	-0.07	-1.24	-0.16	-0.48	-0.51
83	-0.20	0.00	-0.10	-0.10	-0.93	-0.16	-0.40	-0.43
84	-0.22	0.00	-0.11	-0.11	-1.70	-0.16	-0.64	-0.66
85	-0.04	0.00	-0.02	-0.02	-0.44	-0.16	-0.23	-0.25
86	-0.09	0.00	-0.05	-0.05	-1.23	-0.16	-0.45	-0.48
87	0.25	0.00	0.12	0.12	1.12	-0.16	0.24	0.25
88	0.23	0.00	0.11	0.11	1.00	-0.16	0.20	0.21
89	0.15	0.00	0.08	0.08	0.93	-0.16	0.16	0.17
90	0.20	0.00	0.10	0.10	1.22	-0.16	0.24	0.26
91	0.17	0.00	0.08	0.08	0.90	-0.16	0.16	0.17
92	0.14	0.00	0.07	0.07	1.36	-0.16	0.23	0.25

2. *Can you provide systematic documentation of the reasons each study was included or excluded from the analysis?*

Response: In the February 2016 White Paper, EPA provided revised estimates of mortality risk valuation, focusing first on deriving a general population estimate for immediate reductions in the risk of death among adults. The tables below show the original studies that were considered for inclusion in the analysis by type of study (i.e., stated preference and hedonic wage), those that were excluded and the reasons for exclusion where applicable.

For both study types, we used the database of studies compiled for EPA's 2010 White paper as a starting point, adding several studies recommended by the SAB in the Advisory Report dated July 29, 2011, and additional studies published subsequent to the release of the SAB's 2011 Advisory. The decisions to include/exclude a study were based on the selection criteria provided in the 2011 Advisory, as discussed in Section 3 of the 2016 White Paper.

Tables R5 and R6 show the studies that are included in the 2016 White Paper, as well as the studies that were considered but excluded and the reason, by type of study.

Table R5:
Disposition of Stated Preference Studies

Author	Year	Country	Included in 2016 WP	Reason for Exclusion
Alberini et al.	2004	US	✓	.
Corso et al.	2001	US	✓	.
Hammitt and Graham	1999	US	✓	.
Hammitt and Haninger	2010	US	✓	.
Cameron, DeShazo, and Stiffler	2010	US	✓	.
Cameron, DeShazo, and Johnson	2010	US	✓	.
Chestnut, Rowe, and Breffle	2012	US	✓	.
Cameron and DeShazo	2013	US	✓	.
Viscusi, Huber and Bell	2014	US	✓*	.
Buzby et al.	1995	US		latent risk
Carson and Mitchell	2006	US		not a general population estimate (one small town in IL)
Gerking et al.	1988	US		Does not employ state of the art elicitation practices
Hakes and Viscusi	2007	US		not a general population estimate (one small town in AZ)

Author	Year	Country	Included in 2016 WP	Reason for Exclusion
Morris and Hammitt	2001	US		unable to distinguish morbidity and mortality
Brady	2008	US		not a general population estimate (college students)
Ludwig and Cook	2001	US		unable to distinguish morbidity from mortality
Riddel and Shaw	2006	US		not a general population estimate (small survey of NV residents); latent risk
Blomquist et al.	2010	US		unable to differentiate adults from children
Adamowicz et al.	2010	Canada		international study
Alberini and Chiabai	2007	Italy		international study
Alberini et al.	2007	Italy		international study
Alberini et al.	2006b	France, Italy, UK		international study
Alberini and Scasny	2011	Italy, Czech Republic		international study
Alberini and Scasny	2013	Italy		international study
Alberini et al.	2006c	Czech Republic		international study
Andersson and Lindberg	2009	Sweden		international study
Desaigues and Rabl	1995	France		international study
Gyrd-Hansen et al.	2007	Norway		international study
Hammit and Liu	2004	Taiwan		international study
Hultkrantz et al.	2006	Sweden		international study
Itaoka et al.	2007	Japan		international study
Johannesson et al.	1997	Sweden		international study
Johannesson et al.	1996	Sweden		international study
Kidholm	1995	Denmark		international study
Lanoie et al.	1995	Canada		international study
Miller and Guria	1991	New Zealand		international study
Persson et al.	2001	Sweden		international study
Philips et al	1989	UK		international study
Strand	2002	Norway		international study
Tsuge et al.	2005	Japan		international study
Zhang et al.	2013	Canada		international study

Notes: * We included Viscusi, Huber and Bell in the 2016 White Paper because the authors provided a WTP estimate for a risk reduction for a latent risk, converted to the equivalent of an immediate risk reduction. Based on the deliberations of the SAB-EEAC in March 2016, we anticipate dropping this study from future analyses.

Table R6:
Disposition of Hedonic Wage Studies

Author	Year	Country	Included in 2016 WP	Exclusion Reason
Aldy and Viscusi	2008	USA	✓	.
Hersch and Viscusi	2010	USA	✓	.
Kniesner and Viscusi	2005	USA	✓	.
Scotten	2013	USA	✓	.
Scotten and Taylor	2011	USA	✓	.
Viscusi	2004	USA	✓	.
Viscusi	2003	USA	✓	.
Viscusi and Aldy	2007	USA	✓	.
Viscusi and Hersch	2008	USA	✓	.
Berger and Gabriel	1991	USA		injury data quality not equal to CFOI
Dillingham	1985	USA		injury data quality not equal to CFOI
Dillingham and Smith	1984	USA		injury data quality not equal to CFOI
Dorsey and Walzer	1983	USA		injury data quality not equal to CFOI
Evans and Schaur	2010	USA		not sufficiently representative (older sample); no estimates control for non-fatal risk
Evans and Smith	2010	USA		not sufficiently representative (older sample)
Evans and Smith	2008	USA		not sufficiently representative (older sample)
Evans and Smith	2006	USA		not sufficiently representative (older sample)
Garen	1988	USA		injury data quality not equal to CFOI
Gegax	1991	USA		injury data quality not equal to CFOI
Kniesner and Leeth	1991	USA		injury data quality not equal to CFOI
Kniesner, Viscusi, and Ziliak	2010	USA		not sufficiently representative (male head of household only); no estimates control for non-fatal risk
Kniesner, Viscusi, and Ziliak	2006	USA		not sufficiently representative (male head of household only); no estimates control for non-fatal risk
Kniesner, Viscusi, Woock, and Ziliak	2012	USA		not sufficiently representative (male head of household only); no estimates control for non-fatal risk
Leeth and Ruser	2003	USA		no reported estimates for women control for non-fatal risk so cannot construct representative population estimate; risk by occupation
Leigh	1995	USA		injury data quality not equal to CFOI
Leigh	1991	USA		injury data quality not equal to CFOI
Leigh and Folsom	1984	USA		injury data quality not equal to CFOI

Author	Year	Country	Included in 2016 WP	Exclusion Reason
Moore and Viscusi	1988	USA		injury data quality not equal to CFOI
Olson	1981	USA		injury data quality not equal to CFOI
Smith	1974	USA		injury data quality not equal to CFOI
Smith, Evans, Kim and Taylor	2004	USA		no estimates control for non-fatal risk
Viscusi	2013	USA		no estimates control for non-fatal risk
Viscusi	1981	USA		injury data quality not equal to CFOI
Viscusi	1978	USA		injury data quality not equal to CFOI
Arabsheibani and Marin	2000	UK		international study
Marin and Psacharopoulos	1982	UK		international study
Sandy and Elliot	1996	UK		international study
Siebert and Wei	1994	UK		international study
Kim and Fishback	1999	South Korea		international study
Cousineau et al.	1992	Canada		international study
Gunderson and Hyatt	2001	Canada		international study
Martinello and Meng	1992	Canada		international study
Meng	1989	Canada		international study
Meng and Smith	1999	Canada		international study
Meng and Smith	1990	Canada		international study
Weiss et al.	1986	Austria		international study
Miller et al.	1997	Australia		international study

3. *Please provide the criteria that were used to make the inclusion and exclusion decisions and document where selection criteria did not influence study inclusion.*

Response: The selection criteria for the studies themselves are described in Table 1 in the 2016 White Paper. In addition to the study selection criteria, we applied additional criteria to select the estimates to include from each study that met the selection criteria.

Starting again with the stated preference studies, we selected all general population estimates that exhibited evidence of validity. Specifically, we rejected estimates that failed a weak form of scope test (WTP for larger changes in risk were greater than WTP for smaller changes), estimates that were implausibly large or small (negative), and estimates that showed signs of question order effects. Table R7 below lists the mortality risk valuation estimates considered from each study, where the estimates are located in each paper, and, where applicable, the reason for excluding specific estimates.

Table R7: Estimates Selected from Stated Preference Studies

Study	VSL	$YEAR	Location in paper	Included in 2016 WP	Exclusion reason
Hammitt and Graham (1999)	2.08	1998	Table 5	✓	.
Hammitt and Graham (1999)	1.251	1998	Table 5	✓	.
Hammitt and Graham (1999)	4.7	1998	calculated from Table 5	✓	.
Hammitt and Graham (1999)	2.82	1998	calculated based on results from Table 5	✓	.
Hammitt and Graham (1999)	--	1998	Table 6, panel A		question order effects; not calculated
Hammitt and Graham (1999)	--	1998	Table 6, panel A		question order effects; not calculated
Hammitt and Graham (1999)	--	1998	Table 6, panel B		question order effects; not calculated
Hammitt and Graham (1999)	--	1998	Table 6, panel B		question order effects; not calculated
Corso, Hammitt, and Graham (2001)	--	2000	based on information from J. Hammitt		does not pass a weak test; not calculated
Corso, Hammitt, and Graham (2001)	--	2000	based on information from J. Hammitt		does not pass a weak test; not calculated
Corso, Hammitt, and Graham (2001)	10.11	2000	based on information from J. Hammitt	✓	.
Corso, Hammitt, and Graham (2001)	15.57	2000	based on information from J. Hammitt	✓	.
Corso, Hammitt, and Graham (2001)	7.78	2000	based from Jim Hammitt on information	✓	.
Corso, Hammitt, and Graham (2001)	10.21	2000	based on information from J. Hammitt	✓	.
Corso, Hammitt, and Graham (2001)	8.59	2000	based on information from J. Hammitt	✓	.
Corso, Hammitt, and Graham (2001)	9.45	2000	based on information from J. Hammitt	✓	.
Corso, Hammitt, and Graham (2001)	2.4	2000	Table 3		does not pass a weak test
Corso, Hammitt, and Graham (2001)	4.7	2000	Table 3		does not pass a weak test
Corso, Hammitt, and Graham (2001)	3.7	2000	Table 3	✓	.
Corso, Hammitt, and Graham (2001)	5.7	2000	Table 3	✓	.

Study	VSL	$YEAR	Location in paper	Included in 2016 WP	Exclusion reason
Corso, Hammitt, and Graham (2001)	3.2	2000	Table 3	✓	.
Corso, Hammitt, and Graham (2001)	4.2	2000	Table 3	✓	.
Corso, Hammitt, and Graham (2001)	3	2000	Table 3	✓	.
Corso, Hammitt, and Graham (2001)	3.3	2000	Table 3	✓	.
Alberini, et al (2004)	0.7	1999	Table 7	✓	.
Alberini, et al (2004)	1.11	1999	Table 7	✓	.
Alberini, et al (2004)	1.54	1999	Table 7	✓	.
Alberini, et al (2004)	4.83	1999	Table 7	✓	.
Hammitt and Haninger (2010)	6.5	2007	Table 2	✓	.
Hammitt and Haninger (2010)	6.6	2007	Table 3	✓	.
Hammitt and Haninger (2010)	1900	2007	based on information from J. Hammitt		implausibly large
Hammitt and Haninger (2010)	1200	2007	based on information from J. Hammitt		implausibly large
Cameron, DeShazo, and Johnson (2010)	8.81	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	11.01	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	13.16	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	6.56	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	8.74	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	10.91	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	3.59	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	4.5	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	5.42	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	6.26	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	2.62	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	3.55	2003	Table 4	✓	.

Study	VSL	$YEAR	Location in paper	Included in 2016 WP	Exclusion reason
Cameron, DeShazo, and Johnson (2010)	4.45	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	5.14	2003	Table 4	✓	.
Cameron, DeShazo, and Johnson (2010)	9.56	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	5.61	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	3.57	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	7.33	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	4.09	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	2.42	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	3.96	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	2.83	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	2.01	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	2.18	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	3.04	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	2.06	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	1.34	2003	Table 5	✓	.
Cameron, DeShazo, and Johnson (2010)	1.42	2003	Table 5	✓	.
Cameron, DeShazo, and Stiffler (2010)	10.46	2003	page 268	✓	.
Cameron, DeShazo, and Stiffler (2010)	5.72	2003	page 269	✓	.
Cameron, DeShazo, and Stiffler (2010)	9.36	2003	page 269	✓	.
Cameron, DeShazo, and Stiffler (2010)	5.01	2003	page 269	✓	.
Cameron, DeShazo, and Stiffler (2010)	5.83	2003	page 269	✓	.
Cameron, DeShazo, and Stiffler (2010)	3.08	2003	page 269	✓	.
Chestnut, Rowe, and Breffle (2011)	8.09	2002	Table 9	✓	.
Chestnut, Rowe, and Breffle (2011)	5.04	2002	Table 9	✓	.
Chestnut, Rowe, and Breffle (2011)	2.8	2002	Table 9	✓	.

Study	VSL	$YEAR	Location in paper	Included in 2016 WP	Exclusion reason
Chestnut, Rowe, and Breffle (2011)	7.17	2002	Table 9	✓	.
Chestnut, Rowe, and Breffle (2011)	4.58	2002	Table 9	✓	.
Chestnut, Rowe, and Breffle (2011)	2.62	2002	Table 9	✓	.
Chestnut, Rowe, and Breffle (2011)	3.78	2002	Table 10	✓	.
Chestnut, Rowe, and Breffle (2011)	2.21	2002	Table 10	✓	.
Chestnut, Rowe, and Breffle (2011)	1.42	2002	Table 10	✓	.
Chestnut, Rowe, and Breffle (2011)	4.51	2002	Table 10	✓	.
Chestnut, Rowe, and Breffle (2011)	2.64	2002	Table 10	✓	.
Chestnut, Rowe, and Breffle (2011)	1.7	2002	Table 10	✓	.
Cameron and DeShazo (2013)	8.33	2003	Table 2	✓	.
Cameron and DeShazo (2013)	6.74	2003	Table 2	✓	.
Cameron and DeShazo (2013)	5.48	2003	Table 2	✓	.
Cameron and DeShazo (2013)	6.82	2003	Table 2	✓	.
Cameron and DeShazo (2013)	4.81	2003	Table 3	✓	.
Cameron and DeShazo (2013)	9.26	2003	Table 3	✓	.
Cameron and DeShazo (2013)	6.73	2003	Table 3	✓	.
Cameron and DeShazo (2013)	0.72	2003	Table 4	✓	.
Cameron and DeShazo (2013)	5.91	2003	Table 4	✓	.
Viscusi, Huber, and Bell	10.85	2011	page 394	✓	.
Viscusi, Huber, and Bell	15.96	2011	calculated based on info from footnote 16	✓	.

Turning now to the hedonic wage estimates, we also focused on obtaining general population estimates. Estimates for specific subgroups were not captured, unless they produced general population estimates when combined with other reported estimates. Nevertheless, it is the combined estimate that we capture, rather than the estimates for the individual subgroups. Care was taken not to duplicate/replicated estimates reported in more than one paper. As discussed in the response to question 2 above, the selection criteria provided by the SAB in the

2011 Advisory stipulated that selected studies should include controls for nonfatal injuries. As already noted, in some instances entire studies were excluded on this basis. However, other studies did not consistently control for nonfatal injuries in their analyses, including the controls in some specifications but not others. In these cases, we captured only those estimates which explicitly controlled for nonfatal injury. Another of the SAB selection criteria stipulated that studies should construct the risk variable at a sufficiently disaggregated level (e.g., industry and occupation). In response, we excluded estimates that rely on risk measures constructed at the industry level only. Finally, we excluded estimates that did not control for unobserved characteristics using industry and occupation indicators, as recommended in the SAB Advisory. The details of how the selection criteria were applied to estimates, study by study, appears in Table R8.

Table R8: Estimates Selected from Hedonic Wage Studies

Author	Year	Location in Paper	Included in 2016 WP	Exclusion reason
Aldy and Viscusi	2008	Table 1	✓	.
Aldy and Viscusi	2008	Table 2		redundant estimate (identical to Table 1, row 8)
Hersch and Viscusi	2010	Table 3, Column 3	✓	.
Hersch and Viscusi	2010	Table 3, Columns 1-2		no control for non-fatal injury
Hersch and Viscusi	2010	Table 4		no control for non-fatal injury
Hersch and Viscusi	2010	Table 5		repeated analysis from Table 3 but by sub-population
Hersch and Viscusi	2010	Table 6		repeated analysis from Table 3 but with interactions by sub-population (same VSL)
Hersch and Viscusi	2010	Table 7		subpopulation estimate for workers of Mexican origin
Hersch and Viscusi	2010	Table 8		subpopulation estimate for workers of new immigrants
Kniesner and Viscusi	2005	Table 1, estimates (ii) and (iii)	✓	.
Kniesner and Viscusi	2005	Table 1, estimate (i)		redundant estimate (replicates Viscusi 2004)
Kniesner and Viscusi	2005	Table 1, estimates (iv) - (vi)		not a general population sample (male only)
Scotten	2013	Table 2, columns 2-7	✓	.
Scotten	2013	Table 3, column 4	✓	.
Scotten	2013	Table 4, columns 1-6	✓	.
Scotten	2013	Table 2, column 1		redundant estimate (replicates Viscusi 2004)
Scotten	2013	Table 3, columns 1-3		insufficient controls for industry and occupation
Scotten and Taylor	2011	Table 3, all estimates	✓	.
Scotten and Taylor	2011	Table 4, all estimates		not a general population sample (specific to high wage worker subpopulations)

Author	Year	Location in Paper	Included in 2016 WP	Exclusion reason
Viscusi	2004	Table 3, A, 1992-1997 death risk, row 1 ("full sample")	✓	.
Viscusi	2004	Table 3, A, 1997 death risk, row 1 ("full sample")	✓	.
Viscusi	2004	Table 3, B, 1992-1997 death risk, row 1 ("full sample")	✓	.
Viscusi	2004	Table 3, B, 1997 death risk, row 1 ("full sample")	✓	.
Viscusi	2004	Table 2, column 1		redundant estimate (identical to Table 3, row 1)
Viscusi	2004	Table 2, columns 2-3		not a general population sample
Viscusi	2004	Table 3, A, 1992-1997 death risk, rows 2-5		not a general population sample (subsamples of row 1)
Viscusi	2004	Table 3, A, 1997 death risk, rows 2-5		not a general population sample (subsamples of row 1)
Viscusi	2004	Table 3, B, 1992-1997 death risk, rows 2-5		not a general population sample (subsamples of row 1)
Viscusi	2004	Table 3, B, 1997 death risk, rows 2-5		not a general population sample (subsamples of row 1)
Viscusi	2004	Table 4		risk measure is by industry-only
Viscusi	2003	Table 5, Panel A, Full Sample	✓	.
Viscusi	2003	Table 5, Panel B, Full Sample	✓	.
Viscusi	2003	Table 4		redundant estimate (identical to Table 5, row 1)
Viscusi	2003	Table 5, Panel A, Other estimates		not a general population sample (subsamples of row 1)
Viscusi	2003	Table 5, Panel B, Other estimates		not a general population sample (subsamples of row 1)
Viscusi and Aldy	2007	Table 2, Panel B	✓	.
Viscusi and Aldy	2007	Table 2, Panel A		no control for non-fatal injury
Viscusi and Aldy	2007	Table 3, Panel A		no control for non-fatal injury
Viscusi and Aldy	2007	Table 3, Panel B		risk measure by industry only
Viscusi and Hersch	2008	Table 2, Panel A	✓	.
Viscusi and Hersch	2008	Table 2, Panel B		redundant estimates (subsamples of Panel A)
Viscusi and Hersch	2008	Table 3		not a general population sample (smokers only)
Viscusi	2013	All estimates (Table 3)		no control for non-fatal injury
Kniesner, Viscusi, Woock, and Ziliak	2012	All estimates		no control for non-fatal injury; not a general population sample (male head of household)

Author	Year	Location in Paper	Included in 2016 WP	Exclusion reason
Evans and Schaur	2010	All estimates		no control for non-fatal injury; not a general population sample (older workers)
Evans and Smith	2010	All estimates		not a general population sample (older workers)
Kniesner, Viscusi, and Ziliak	2010	All estimates		no control for non-fatal injury; not a general population sample (male head of household)
Evans and Smith	2008	All estimates		not a general population sample (older workers)
Evans and Smith	2006	All estimates		not a general population sample (older workers)
Kniesner, Viscusi, and Ziliak	2006	All estimates		no control for non-fatal injury; not a general population sample (male head of household)
Smith, Evans, Kim and Taylor	2004	All estimates		no control for non-fatal injury

4. *Please provide more information about how the adjustment for income elasticity was applied in the estimation of VSL. In particular, please indicate whether the adjustment for income elasticity was applied before or after aggregating the estimates distinguished by income.*

(Please see the following additional explanation):

The details on adjustments to measures and how the within study weighting was undertaken need to be clarified. The following table took some of the results for two studies from Table B-3 and Table 6 in the white paper. Two transitions are illustrated. First, the far left column I assume is the original VSL estimate in the study. Then the middle column is reported as in 2013 dollars. The last column is what is reported in Table 6 in the white papers as 2013 dollars. It is different from the middle column. I assume this is due to adjustment for income growth between the year of the date collection and 2013. Is that correct? Was it household income growth or GDP per capita growth?

There is yet another transition in some cases for within study weighting. Was the income adjustment applied before or after the weighting? Did the adjustment account for different growth rates by type of demographic and so forth? My point in attaching the table is that there are a number of different values for VSL associated with the same study – so a flow chart outlining the steps in the analysis would help.

Alberini (Table B-3)

Sample Size	Estimate in $ Millions	Year	Estimate in Millions $2013	Table 6 Estimate in Million $2013
556	0.70	1999	0.98	1.06
556	1.54	1999	2.15	2.33
548	1.10	1999	1.54	1.66
548	4.83	1999	6.75	7.30

Selected Corso Hammett and Graham

Sample Size	Estimate in $ Millions	Year	Estimate in Millions $2013	Table 6 Estimate in Million $2013

288	3.70	2000	5.01	5.66
288	5.70	2000	7.71	8.71
288	10.11	2000	13.68	15.45
288	15.57	2000	21.07	23.80

Response: The differences between the estimates in Table 6 from the 2016 White Paper and those in Appendix B are as follows:

The estimates in Table 6 of the White Paper adjusted original estimates to $2013, weighted them by population shares if necessary, and then assumed an income elasticity of 0.7 to arrive at the final figures. These correspond to the final column (column 5) in the tables above.

The estimates in Appendix B adjust to $2013, weight by population shares, but do not make any adjustments for income growth. These correspond to the fourth column in the tables above.[2]

Income growth adjustments were based on GDP per capita.

General Process for weighting, inflation, and real income adjustments

The adjustment for income elasticity was applied after first adjusting to 2013 dollars, and then any weighting for subpopulations. Specifically, our steps to estimate an income-adjusted 2013 value are:

1. Record original study VSL in study year $.

2. Adjust estimates from step 1 to $2013 using CPI.

3. Adjust estimates from step 2 to obtain "general population" VSL. This was done by applying any necessary population weighting to obtain a "general population" VSL from the subpopulation estimates in the original study. The weights are based on population proportions in the year 2013.
    - These are the estimates in Appendix B.

4. Adjust estimates from step 3 to 2013 income levels using (a) Real GDP/person the year the study data were collected, (b) Real GDP/person in 2013, and (c) an assumed income elasticity.
    - These are the estimates in Table 6, assuming an income elasticity of 0.7.

[2] Note that the data in Table R1 presented above in response to Question 1 does not include an adjustment for income elasticity.

By example, here is the process for Viscusi & Hersch (2008) which requires weighting of separate VSL estimates for smokers and non-smokers to obtain a general population estimate.

Step	Description and parameter values	Example (Viscusi & Hersch, 2008)
1.	Original study VSL estimates • The study reported values in $2000	$7.39 (non-smokers) $7.32 (smokers)
2.	Adjust to $2013 using study year $ and CPI • Study $year = $2000 • CPI for 2013/2000 = 1.35	Study VSLs in 2013$ = $7.39 * 1.35 = $10.00 (non-smokers) = $7.32* 1.35 = $9.90 (smokers) *= Table B-15, column 6 values*
3.	Weight subsamples to obtain "general population" VSL • 0.819 of population are non-smokers • 0.181 are smokers	General Population VSL in $2013 = 0.819*$10.00 + 0.181*$9.90 = $9.98 *= Table B-15 "weighted estimate" value*
4.	Adjust for changes in real income. Based on real GDP/person in the year data was collected for the study and in 2013, and IEVSL. • Data year = (1999) • Real income 2013 / Real Income 1999 = 1.1492 • Income elasticity = 0.7	Income-adjusted VSL to 2013 in $2013 = $9.98 $(1.1492)^{0.7}$ = $11.0 *= Table 6 value*

In step 3 we recognize that it may be preferable to use population weights from the year the study was conducted to create a 'general population' estimate for that year. In most cases the difference would not be large because the share of males and females, for example, is relatively stable. In other cases (e.g., smoking status), there may be larger differences between the 1990's and 2013.